



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,178	09/19/2001	Kenichi Aoyagi	07481.0018	9413

7590 02/26/2003

Finnegan, Henderson, Farabow  
Garrett & Dunner, L.L.P.  
1300 I Street, N.W.  
Washington, DC 20005-3315

EXAMINER
----------

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
----------	--------------

1774

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/955178

Applicant(s)

Aoyagi

Examiner

Thompson

Art Unit

1774

AS-11

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12-9-02.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                              | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ | 6) <input type="checkbox"/> Other:  |

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearce et al., U.S. pat. No. 5,204,033 in view of Krueger, U.S. pat. No. 5,085,928.

Pearce discloses a transport member consisting of a carbon fiber reinforced plastic as per instant claims 1-2. (See col. 1, lines 1-53). Pearce does not disclose layers with a unidirectional reinforced fiber or the orientation of the fiber with respect to the transport member. Krueger teaches, in analogous art, a fiber reinforced composite matrix that includes one or more layers of unidirectional fibers wherein the reinforcement direction may be 0/90/90/0 as per instant claims 1 and 2. (See abstract; col. 1, lines 44-55 and col. 3, lines 67- col. 4, line 10). Krueger teaches that the unidirectional fibers in the direction of 0/90/90/0 add longitudinal strength and longitudinal modulus. In reinforced fiber matrices. Therefore it would have been obvious to one of ordinary skill in the art to make the reinforced matrix with the unidirectional fibers in the direction of 0/90/90/0 because Krueger teaches that orientation in that direction result in surprisingly good retention of longitudinal strength and longitudinal modulus due to the more efficient load transfer of unidirectional reinforcement fibers. See column 3, lines 49-55. Also the thru thickness variation is reduced. (Krueger, col. 4, line 20-34) This also results in a stronger product.

Claims 3-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearce et al., 5,204,033 (above). In view of Japanese Pat. No. 04-215599 (JP '599) (abstract).

Pearce discloses a transport member consisting of a carbon fiber reinforced plastic (Col. 1, lines 1-53). The reference does not disclose skin layers or core layers with fiber orientation as per instant claims 3-5. JP '599 teaches a super light weight sandwich panel that is comprised of a unidirectional carbon fiber reinforced plastic comprised of a four-layer structure wherein the skin layer comprises two layers that are laid in the direction of 0 degrees and two additional layers in The direction of 90 degrees and bonded to a honeycomb layer as per instant claims 3-5 and 13. ( see abstract). It would have been obvious to one of ordinary skill in the art to have a unidirectional carbon reinforced fiber with a multilayered structure with a skin and core configuration with specific orientation in order to increase the strength and load transfer of the transport member.

Pearce does not disclose the tensile elasticity of the carbon fiber as per instant claim 5. Since Pearce discloses a transport member having a carbon fiber reinforced, the tensile elasticity would be an inherent feature. The volume recited in claims 8 and 9 are not disclosed by Pearce or JP '599. However, the volume used is an result effective variable as it affects the strength of the layer. Therefore it is optimizable. Discovery of an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215 (1980). Therefore it would have been obvious to one of ordinary skill in the art to make the layers having the volume of the first and second skin layers be 20- 100% and 0-80 respectively with the third layer having volume of 0-20 in order to obtain good tensile strength

and elasticity of the carbon fiber reinforced material. The bending elasticity in the longitudinal direction is 200-800 Gpa and in the transverse direction is 30 to 100 Gpa are these are physical properties of the carbon fiber reinforced plastic used to make the transport member as per instant claim 6. Therefore these features are inherent. The expression represented in claim 7 describes a physical property and is therefore an inherent feature. The logarithmic vibration damping factor of the transport member and the specific gravity of the fiber reinforced plastic are physical properties and are inherent as they are physical properties.

Applicant's arguments filed December 9, 2002 have been fully considered but they are not persuasive.

The 112, second paragraph rejections have been withdrawn due to applicant's arguments and amendments made to the claims.

Applicant argues in the 103 rejection that Pearce does not teach a preform which can be used as a transport member for transporting an article and that Pearce discloses a different device. Applicant has amended the claims to read, "said transport member is used for transporting an article to be transported". Applicant has added a limitation towards intended use. The intended use of the article lends no patentable weight in this instance. Applicant continues to claim a transport member comprising a fiber reinforced plastic having two layers, each layer having unidirectional fibers. Pearce teaches a transport member having fiber reinforced plastic having two layers and the layers have unidirectional fibers. Although Pearce does not teach the orientation of the fiber, orienting fibers at different angles to

achieve optimum properties is well known in the art as shown by Krueger.

Applicant further argues that the combination of the references teaches away from the instant invention because the composite of Krueger can be formed according to Pearce's winding method. The method of manufacturing the composite is not at issue here. Krueger was included in the rejection that these orientations do exist and the effects they have on the composite. Therefore the combination is not in error.

Applicant argues that the Pearce in view of JP '599 does not disclose the skin layers or core layers have fiber orientations as recited or the tensile elasticity, bending elasticity or bulk specific gravity. However, the JP '599 reference was included to show that these orientations exist. See abstract. Further, the references show the same polymers and carbon used in the fiber reinforced plastic. Therefore the tensile elasticity, as well as the bending elasticity, specific gravity and damping factor, would be expected to be the same since the same materials are being used in the same manner. The volume and thickness of the layers are optimizable features as the volume and thickness each affect the strength of the composite. Discovery of an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215. Applicant further argues that the winding method of Pearce cannot be used to make the composite having the 0/90 orientations. However, applicant shows no evidence of this. As mentioned above, the method of manufacture is not at issue here. The method of manufacture is not a determining factor as to whether references can be combined. The end product is the same. The rejection is therefore maintained.

Applicant's amendment necessitated the new ground(s) of rejection presented

09/955178  
Art Unit 1774

in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Exr Thompson whose telephone number is 305-4488. The examiner can normally be reached on Mondays through Friday from 9 to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, C. Kelly, can be reached on (703) 308-0499. The fax phone number for the organization where this application or proceeding is assigned is 305-5408.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

CYNTHIA H. KELLY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

